PATENT CLAIMS

What is claimed is:

1. A method for controlled application of a stator current set point value ($\underline{I}_{Snom}$) and of a torque set point value (M_{nom}) for a converter-fed rotating-field machine (4), with a field-forming current component (I_{Sdnom}) of the stator current set point value ($\underline{I}_{Snom}$) being calculated as a function of a predetermined rotor flux set point value (Ψ_{Rnom}) and of a determined rotor flux actual value (Ψ_R), and with a torque-forming current component (I_{Sqnom}) of the stator current set point value ($\underline{I}_{Snom}$) being calculated as a function of a predetermined torque set point value (M_{nom}), of the determined rotor flux actual value (Ψ_R) and of a determined torque-forming current component (I_{Sq}) of a measured stator current ($\underline{I}_S$), with a stator angular frequency actual value (ω_s) being determined as a function of a determined rotor slip frequency (ω_R) and of an angular frequency (ω) and with the integral of the stator voltage (Ψ_{Knom}) being calculated as a manipulated variable from these calculated values (I_{Sdnom}, I_{Sqnom}, ω_S, Ψ_R) as a function of the parameters comprising the frequency-dependent stray inductance (L_o) and the stator resistance (R_s), from which integral a flux path curve is derived, which is selected from stored off-line optimized flux path curves.

2. The method as claimed in Claim 1, characterized in that a steady-state normalized stator voltage (U_{Sstead}), which is normalized by means of a measured intermediate circuit voltage (U_D), is calculated as a function of the calculated current components (I_{Sdnom}, I_{Sqnom}), of the parameters comprising the frequency-dependent stray inductance (L_o) and the stator resistance (R_S), the stator angular frequency (ω_S) and the rotor flux actual value (Ψ_R).

3. The method as claimed in one of the abovementioned claims, characterized in that, in order to determine a terminal flux actual value ($\underline{\Psi}_K$) before the integration of the stator voltage ($\underline{U}_S$), a voltage drop caused by the instantaneous stator current ($\underline{I}_S$) across the stator resistance (R_S) is subtracted from this and, after the integration, a voltage drop caused by the stator current set point value ($\underline{I}_{Snom}$) to be applied across the stator resistance (R_S), divided by the stator angular frequency ω_S, is added after transformation to a coordinate system which is synchronized to the rotor flux.

4. The method as claimed in Claim 2, characterized in that a drive level (a) and a voltage angle (δ_U) are calculated as polar components from the normalized steady-state stator voltage ($\underline{u}_{Sstat}$).

5. The method as claimed in Claims 2 and 4, characterized in that a fundamental terminal flux magnitude is calculated as a function of the measured intermediate-circuit voltage (U_D) of the calculated stator angular frequency (ω_S) from the drive level (a) using the following equation:

$$|\underline{\Psi}_K| = \frac{a \cdot U_D \cdot \frac{2}{\pi}}{\omega_S}$$

6. The method as claimed in Claims 2 and 4, characterized in that a continuous terminal flux nominal angle ($\gamma_{\Psi Knom}$) is calculated as a function of a determined continuous rotor flux angle ($\gamma_{\Psi R}$) and of a determined angle ($\delta_{\Psi K}$) between the terminal flux (Ψ_K) and the rotor flux (Ψ_R) using the following equation:

$$\gamma_{\Psi Knom} = \gamma_{\Psi R} + \delta_{\Psi K}$$

7. The method as claimed in Claim 4, characterized in that the polar component comprising the voltage angle (δ_U) of the normalized steady-state stator voltage component ($\underline{u}_{Sdstead}$) is calculated using the following equation:

$$\delta_U = \arcsin \frac{U_{Sdstead}}{a \cdot U_D \cdot 2/\pi} + 90°$$

8. The method as claimed in Claim 7, characterized in that the angle ($\delta_{\Psi K}$) between the terminal flux (Ψ_K) and the rotor flux (Ψ_R) is calculated using the following equation:

$$\delta_{\Psi K} = \delta_u - 90° = \arcsin \frac{U_{sdstead}}{a \cdot U_D \cdot 2/\pi}$$